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MINERALOGY AND PETROGRAPHY.[1]

New Minerals.—*Langbanite* is the name applied by G. Flink[2] to a mineral which occurs in small black hexagonal crystals in a granular limestone at Långban, Sweden. In habit it is tabular or prismatic, with the prism faces but slightly developed. Its hardness is 6.5, specific gravity = 4.918. Its axial ratio is 1 : 1.6437. Its analysis yielded,—

Sb_2O_5	SiO_2	MnO	FeO
15.42	10.88	64.00	10.32

The discoverer regards it as silicate of manganese (Mn_5SiO_7) combined with antimonate of iron ($Fe_3Sb_2O_8$) in the proportions 37 : 10.——*Webskyite.*—This mineral, named by R. Brauns[3] after the late Professor Websky, of Berlin, is a decomposition product of the serpentine occurring in the paleopikrite of Amelose, near Biedenkopf, in Nassau. It occurs in black amorphous masses, with a bluish-green streak. Its hardness is 3 and its specific gravity 1.771. It is apparently isotropic in thin sections, where it possesses a green color. Its composition is as follows:

SiO_2	$Al_2O_3.Fe_2O_3$	FeO	MgO	H_2O	Loss at 110°
34.91	9.60	3.13	21.62	9.84	21.20

This corresponds to the formula $H_6R_4Si_3O_{13} + 6H_2O$, in which R = Mg and Fe.——*Laubanite* is described by Traube[4] as a new zeolite from the druses of the basalt occurring near Lauban, in Silesia. Its color is milk-white. It possesses a short columnar habit and a hardness of 4.5–5. It is found only in small crystals, implanted on phillipsite and other associated minerals. These crystals under the microscope are seen to be composed of little bundles of fibres. Its composition approaches very near to that of laumontite, from which it differs only in its percentages of calcium and water of crystallization.

Laubanite.	Laumontite.	Phillipsite.
$Al_2(SiO_3)_3$ $2Ca(SiO_3) + 6H_2O$	$Al_2(SiO_3)_3$ $Ca(SiO_3) + 4H_2O$	$3Al_2(SiO_3)_3$ $2Ca(SiO_3)$ $K_2(SiO_3) + 12H_2O$

Recent Investigations of American Minerals. *Mica.*—Prof. F. W. Clarke,[5] of the U. S. Geological Survey, has recently published an interesting paper in which the relations between three American iron-micas are discussed. The three micas in question are lepidomelane from Baltimore, Md., and from Litchfield, Me., and annite from Rockport. Their compositions may be represented by the formulas

$R'_6R''_4R'''_2Si_5O_{20}$ (Rockport); $R'_6R''_3R'''_4Si_5O_{22}$ (Baltimore); and $R'_6R''_2R'''_6Si_5O_{24}$ (Litchfield).

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[1] Edited by DR. W. S. BAYLEY, Madison, Wisconsin.

[2] Zeitschrift für Krystallographie, xiii., 1887, p. 1.

[3] Neues Jahrb. f. Min., etc., Beil. Band., v., 1887, p. 318.

[4] Ib., ii. p. 64.

[5] Amer. Jour. Sci., xxxiv., Oct. 1887, p. 131.

The relations existing between them may be best shown by supposing two of the univalent groups (AlO) to replace one (R'''_2O_2). Assuming this, the formulas may be written:

$R'_{14}R'''_2(SiO_4)_5$ = Rockport mica.
$R'_{12}(AlO)_2R'''_2(SiO_4)_5$ = Baltimore mica.
$R'_{10}(AlO)_4R'''_2(SiO_4)_5$ = Litchfield mica.

In the same paper there are also given analyses of iron-micas from Auburn, Me., and Pike's Peak, Colorado, and one of a muscovite from Alexander County, N. C., containing 1.10 per cent. of TiO_2.——*Howlite.*—This mineral was first identified by Professor H. How,[1] of Windsor, Nova Scotia, who named it silico-borocalcite. Messrs. Penfield and Sperry,[2] having recently come into the possession of a comparatively pure specimen of the mineral, have re-examined it. They find it to be composed as follows:

SiO_2	B_2O_3	CaO	Na_2O	K_2O	H_2O
15.33	44.52	27.94	0.53	0.13	11.55

They regard it as a distinct species with the formula $H_5Ca_2B_5SiO_{14}$.——*Cassiterite.*—The tin-stone of Mexico is divided by Professor Genth[3] into two varieties, a red and a yellow variety. Both are supposed to have been formed by precipitation from solution. The red variety is found in very small crystals, with a hexagonal habit. Analysis shows it to consist of dioxide of tin, containing a little ferric oxide and occasionally small quantities of arsenic pentoxide. The yellow variety occurs principally in imitative forms. It contains very little ferric oxide, but considerable arsenic pentoxide, and always an admixture of zinc oxide. Crystals of cassiterite implanted on hematite (after the manner of rutile on hematite from St. Gothard), and pseudomorphs of the former after the latter mineral, as well as after magnetite, are described by Professor Genth as not very uncommon in the sands and ores from the state of Durango.——*Mimetite* has been found in small crystals at the Mina del Diablo, Durango, Mexico. More frequently, however, it occurs in pseudomorphic forms after an unknown mineral, supposed by Dr. Genth[4] to be anglesite, by Professor von Rath to be galena, and by Dr. Brezina to be mendipite.——*Vanadinite.*—This mineral occurs on quartz in the Mammoth Gold Mine, near Oracle, Pinal County, Arizona. It is sometimes coated with calcite, which is in turn coated with a second generation of vanadinite. Other localities for vanadinite are Yavapai County, Arizona; McGregor Mine, Grant County, New Mexico; and Bald Mountain Mine, Beaverhead County,

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[1] Philos. Mag., iv. xxxv., p. 32.

[2] Amer. Jour. Sci., Sept. 1887, p. 220.

[3] Contributions from the Chemical Laboratory of the University of Pennsylvania, xxix., 1887, p. 4.

[4] Ib., p. 10.

Montana.——*Descloizite* (*ramirite*), from San Luis Potosi, Mexico, yielded Professor Genth[1] on analysis the figures,—

PbO	CuO	ZnO	As_2O_5	V_2O_5	P_2O_5	Loss on ignition
54.52	6.58	12.70	3.63	19.99	0.13	2.62

a result not very different from that obtained by Penfield[2] in 1883.——*Tapalpite*, from the Sierra de Tapalpa, Jalisco, Mexico, is regarded by Rammelsberg as being represented by the formula $Ag_2S.Bi_2Te_2$. Professor Genth[3] has analyzed some comparatively pure material, with this result:

Ag	Pb	Bi	Cu	Te	S
38.59	7.24	25.05	0.21	17.43	8.24

which, after deducting the impurities, would give, as the composition of tapalpite,

Ag	Bi	Te	S
46.09	24.99	21.67	7.25

corresponding to a normal sulpho-telluro salt of silver and bismuth.——In the paper in which the above-mentioned minerals are discussed, Professor Genth describes *pyrite* pseudomorphs after *pyrrhotite*, from Colusa County, Cal. ; *hessite*, from Tombstone, Arizona; *allanite*, from Statesville, N. C.; *willemite*, from Socorro County, New Mexico; and *hisingerite* pseudomorphs after *calcite*, from Ducktown, Tenn.——*Bismutho-sphærite*.—This mineral has for some time been regarded as a basic carbonate of bismuth, but its composition has not until very recently been determined by means of analysis. A short time ago Mr. H. L. Wells[4] obtained large specimens of the mineral from Willemantic and Portland, Conn. The Willemantic occurrence is described as a dark-gray mineral, holding in its centre a nucleus of bismuthinite. Its specific gravity is 7.42. Under the microscope it was seen to consist of a dark ground-mass, in which patches of a pale yellowish-green color are scattered. The dark portion is almost opaque from the numerous black dust-like inclusions it contains. These are supposed to represent traces of the original mineral from which the bismutho-spharite was derived. An analysis yielded,—

Bi_2O_3	SO_3	Silicates	CO_2	H_2O
91.64	0.34	0.08	8.03	0.47

corresponding to the formula $Bi_2O_3.CO_2 = (BiO)_2CO_3$.——*Crocidolite*.—Messrs. Chester and Cairns[5] have recently published an analysis of the bluish-gray fibrous crocidolite from Beacon Pole Hill, near Cumberland, Rhode Island, with the result (as the mean of two analyses):

SiO_2	Fe_2O_3	FeO	MgO	Na_2O	H_2O
51 58	16.90	21.22	0.15	6.34	3.79

[1] Ib., p. 15.

[2] Amer. Jour. Sci., xxvi. p. 361.

[3] L. c., p. 18.

[4] Amer. Jour. Sci., October, 1887, p. 271.

[5] Ib , xxxiv., 1887, p. 108.

This composition is represented by the authors by the formula $Fe_3Na_2H_4Fe_2(Si_9O_3)_9 = 3FeO.Na_2O.2H_2O.Fe_2O_3.9SiO_2$, in which the water is regarded as basic. The authors cannot accept the prevalent view that crocidolite is merely a fibrous arfvedsonite. ——*Datholite.*—Mr. Whitfield[1] has analyzed the datholite from Bergen Hill, N. J., determining the boric acid by the Gooch[2] method. His figures are:

SiO_2	FeO	CaO	B_2O_5	H_2O
35.74	0.31	35.14	22.60	6.14

corresponding to the formula $B_2O_3.H_2O.2CaO.2SiO_2 = H.CaSiO_3.BO_2$, the generally accepted formula for this mineral.——*Ulexite.*—Ulexite, from Rhodes Marsh, Esmeralda County, Nevada, yielded the same analyst[3] the following figures:

SiO_2	Cl	B_2O_3	SO_3	CaO	Na_2O	K_2O	H_2O
0.04	2.38	43.20	0.28	14.52	10.20	0.44	29.46

These figures are represented by the formula $NaCaB_5O_9 + 6H_2O$, after making certain allowances for impurities.——*Siderite (sphærosiderite).*—This mineral[4] occurs at Baltimore, Md., associated with zeolites in the gneiss of the Jones Falls quarries. The crystals are small and lenticular in shape. They possess only the forms R and 0R, except in one instance, where the negative scalenohedron $-\frac{1}{4}R^4$ is supposed to occur. In these crystals the faces are generally rounded, forming a lens-shaped body. Frequently two of these lenses are grouped together so as to form apparent twins. And further, many lenses grouped together produce a perfect sphere. Analyses of selected material by Mr. A. G. Palmer gave,—

FeO	MgO	MnO	ZnO	CO_2
59.63	1.05	0.91	1.72	37.93

It is thought that the presence of manganese and zinc may have had some influence in the production of these rounded forms, not uncommon in the pure manganese carbonate-rhodochrosite. ——*Samarskite.*—Samarskite[5] is found in the coarse-grained granitic veins cutting the schists in which the zeolites (referred to above) occur. It is described by Professor König as a very splintery, black mineral with a hardness of about 6–7. Its specific gravity is 6.146. An analysis yielded,—

Metallic acids	UO_2	Y, Er, etc.	(CeTh)O	FeO
56.40	13.48	11.90	3.85	8.98

Fe_2O_3	Al_2O_3	Ignition
1.66	2.00	0.30

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[1] Ib., October, 1887, p. 281.

[2] Amer. Chem. Jour., ix., 1887, p. 23, and ii., 1880, p. 247.

[3] L. c.

[4] Notes on the Minerals occurring in the Neighborhood of Baltimore, by G. H. Williams, Ph.D., Baltimore, 1887, p. 12.

[5] Ib., p. 16.

The specific gravity of the metallic acids (5.769) is too high for niobic acid, while no tantalic acid was detectable by Rose's method,—facts which Professor König does not understand.——*Beaumontite.*—Several crystals of this mineral have recently been measured by Messrs. Burton and Gill,[1] who find no reason to suppose that it is not crystallographically identical with heulandite, as Des Cloizeaux found it to be in its optical properties.——*Rutile.*—The rutile crystals occurring in the spodumene-bearing pockets of the gneiss in Sharp's township, Alexander County, N. C., are described by Messrs. Hidden and Washington[2] as small, with the rare basal pinacoid prominent and well polished. Measurements of these crystals resulted in the detection of the new forms $\frac{2}{7}P$, $\frac{1}{2}P$, $\frac{2}{3}P$, $4P$, and $P\frac{9}{8}$. A recalculation of the axial relations gave 1 : 0.64425.——*Apatite.*—A small crystal of apatite implanted on muscovite, from the same locality as that mentioned for rutile, is described by the same writers as almost unique in habit, the prisms $\frac{1}{2}P$, P, and $2P2$ predominating. From data obtained in the measurement of this crystal, a recalculation of the axial relations for apatite gives this as 1 : 0.7343. A cruciform twin of apatite is described and figured, in which the twinning plane is $2P2$. This is interesting as the first description of a twin of this species.——*Beryl.*—Two new planes have been discovered by the same authors on the emerald beryls of the Alexander County locality. These planes are $\frac{1}{12}P$ and $\frac{15}{7}P\frac{15}{8}$. On all the beryl from this locality it was observed that the prism face ∞P is perfectly smooth, while $\infty P2$ is covered with little triangular pits.——*Quartz.*—Some time ago Vom Rath[3] noted the occurrence of the plane $\infty P\frac{4}{3}$ on the alternate prismatic edges of certain quartz-crystals from Alexander County, N. C. Messrs. Hidden and Washington[4] find this same form holohedrally developed in each consecutive prismatic edge.——*Topaz.*—A clear crystal of topaz[4] from Zacatecas, Mexico, contains the new plane $7P\infty$.——*Pyroxene.*—Certain crystals of pyroxene from Orange County, N. Y., possess[5] a tubular habit due to the development of the basal plane, and are remarkable besides in that they are hemimorphic in the direction of the vertical axis. The upper portions of the crystals show the forms $0P$, $-P$, P, $2P$, ∞P, $\infty P\grave{\infty}$, and $\infty P\bar{\infty}$. Moreover, the lower planes are so developed that these portions of the crystals must be regarded as twinned, while the upper portions are simple individuals.——*Scorodite.*—In a late number of the *American Journal of Science*, Mr. Hague[6] discusses the deposition of scorodite from the arsenical waters of the Yellowstone National Park. The mineral occurs as a green coating covering the siliceous sinter deposited by the Joseph's Coat Springs and other geysers, and is also often found in little nodules in the cavities of this sinter. An analysis of the purified scorodite yielded Mr. Whitfield,—

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[1] Ib., p. 10.

[2] Amer. Jour. Sci., xxxiii., 1887, p. 501.

[3] Zeits. f. Krystal., xii., p. 456.

[4] L. c.

[5] G. H. Williams, Amer. Jour. Sci., Oct. 1887, p. 275.

[6] September, 1887, p. 171.

Fe_2O_3	As_2O_5	H_2O
34.94	48.79	16.27

Analyses of the waters of these geysers show a small percentage of arsenious acid.——Reusch[1] has examined the crystallized *kaolin* from Denver, Colorado, to which Cross and Hillebrand first called attention.[2] He declares it to be triclinic and not orthorhombic as Hillebrand supposed.——A. Kenngott[3] describes two peculiar crystals of *gypsum* from Poland, Ohio, and calls attention to a new formula for *tantalite* from Dakota, based upon the analysis of Schaeffer,[4] published a few years ago.

BOTANY.[5]

The Genus Geaster.[6]—Dr. G. B. De Toni, of the Botanical Institute of the University of Padua, has lately made a careful revision of the genus Geaster. Accepting, with Fries, the definition of the genus as proposed by Micheli in 1729, after much reduction, he increases the number from fourteen, as enumerated by the illustrious Swedish savant in 1829, to forty-eight well-authenticated species. Making a careful study of the leading features of the species, he has been enabled to arrange them into seven quite distinct and fairly recognizable sections, as follows:

1. COLUMNATI.—*Inner peridium supported on several pedicels.*

This section includes the singular *G. coliformis* Dicks. with many mouths to the inner peridium, and *G. columnatus* Lev., from Chili, having but a single orifice.

2. FORNICATI.—*Outer peridium separating into two distinct strata, one obversely fornicate.*

This contains three species,—*G. fornicatus* Huds., and the little-known *G. radicans* B. & C., and *G. welwitschii* Mont. We may here remark that this fibrous lowest stratum clinging to the earth exists in *G. limbatus* Fr., and perhaps in several other Geasters.

3. CUPULATI.—*Outer peridium augmented by a membranaceous, often irregular cupule about the base of the inner peridium.*

This section contains only *G. triplex* Jungh. and the uncertain *G. duplicatus* Chev. We have observed this basal membrane in other species of Geaster; it occurs as a mere incidental breaking away of the lower portion of the inner fleshy stratum of the outer peridium. Specimens of *G. duplicatus* are to be found

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[1] Neues Jahrb. f. Min., etc., 1887, ii., p. 70.

[2] Bull. U. S. G. S., No. 20.

[3] Ib., 1887, ii., p. 84.

[4] Amer. Jour. Sci., 1884, xxviii., p. 430.

[5] Edited by Prof. CHARLES E. BESSEY, Lincoln, Nebraska.

[6] "Revisio monographica generis Geasteris, Mich." Auctore Dr. G. B. De Toni. Revue Mycologique, No. 34, Avril, 1887.